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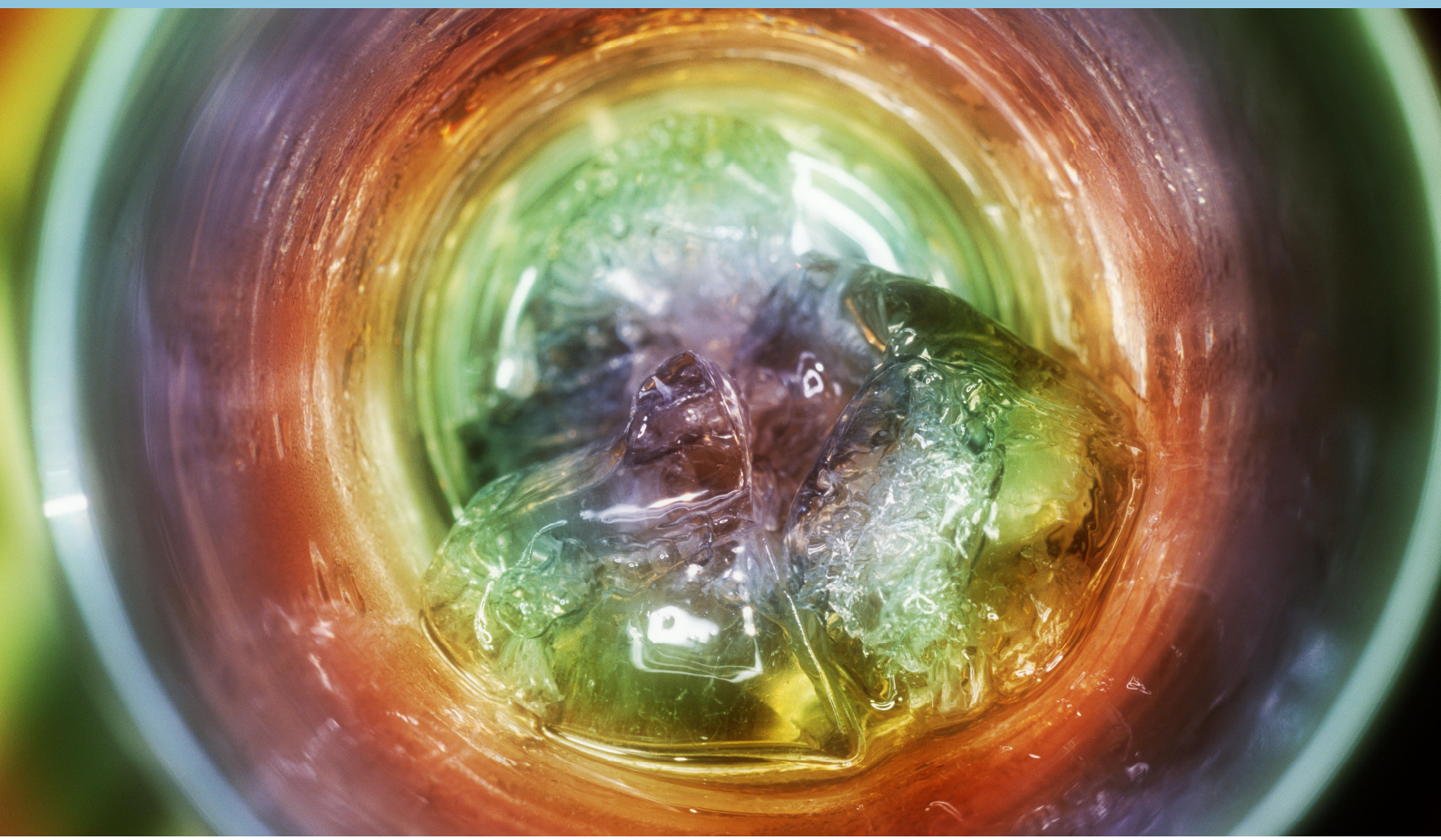

mw3e

SDI A/B mixer with embedded audio processing

user manual

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1 System Overview

This manual describes the function of the MW-3E, which is the most full featured Eyeheight mixer/wipe unit. Eyeheight also offer the MW-2 and MW-3 range of GeNETics modular products.

1.1 The MW-3E product

The MW-3E is an A/B (2-Input) SDI Mixer/WipeCut unit which will output a variety of transitions commonly used in transmission and post production. The main features are as follows:

- A/B Mix/Cut transitions
- A/B Wipe transitions with 8 wipe patterns with coloured/soft borders
- Embedded Audio Mixing follows video transitions
- Embedded Audio Lead/Lag Transitions.
- Embedded audio manipulation (LR swap, Mono….)
- Programmable (Auto) or manual video and audio transitions
- Preview Output with safe area generator built in.
- Internal Matte and Black Generator.
- Up to +/-32uS user definable synchronisation window for A/B Inputs
- External Digital Reference Input ensures output stability
- Transparent to all embedded signals
- Automation controllable
- 6 user memories
- GPI inputs to enable take to A or take to B plus 6 Scripted GPI's
- Relay outputs to indicate on air source either, A, B, Matte or Black

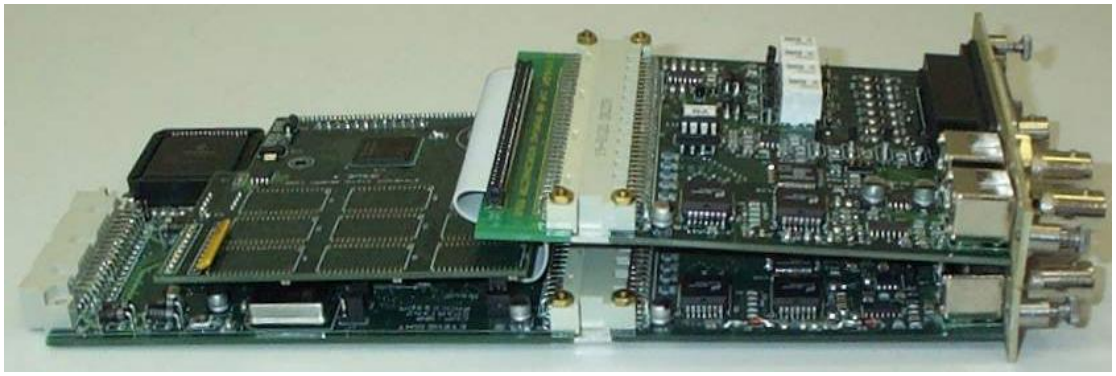

Figure 1-1 MW-3E module

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1.2 Applications for the MW-3E

Applications for the MW-3E include the following:

- Presentation and Master Control systems (Inc. Eyeheight PresTX)
- Simple Video and Audio Mixing systems. (Post Production)
- Offline duplication suites, top and tailing

The MW-3E will be used in a situation where any A/B mix or wipe transitions are used. Normally the A and B inputs will be fed from a routing switcher to obtain the maximum functionality.

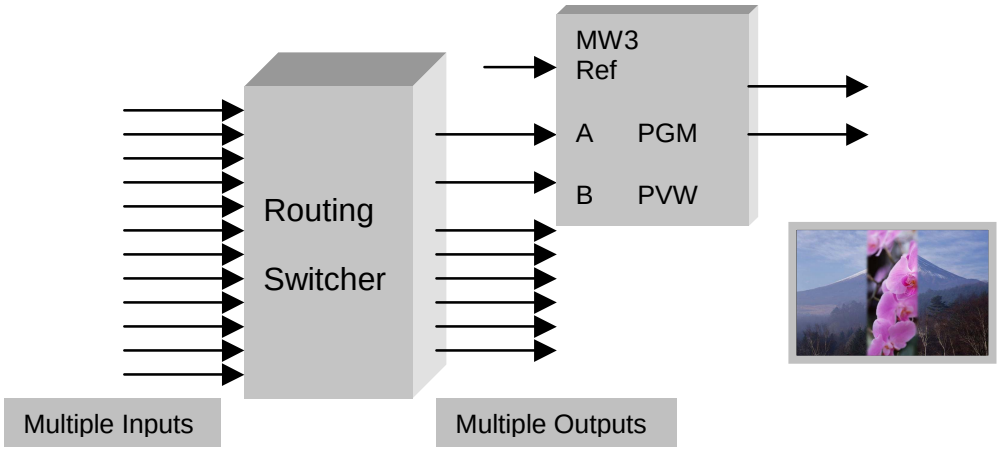

Figure 1-2 MW-3E configured witha router to provide expanded inputs

1.3 Associated Equipment

The MW-3E is a module and requires both a chassis and a control surface to function.

1.3.1 Chassis Types

- The 1RU chassis is called a **flexiBox** (Order code FB-9) This will hold a maximum of 3 MW-3E Modules with “Hot Swap” redundant PSU option and “Hot Swap” Modules.
- The 1RU chassis is called a **maxiBox** (Order code MX-9) This also will hold a maximum of 3 MW-3E Modules but has no redundant PSU option and the MW-3E units must be factory fitted.

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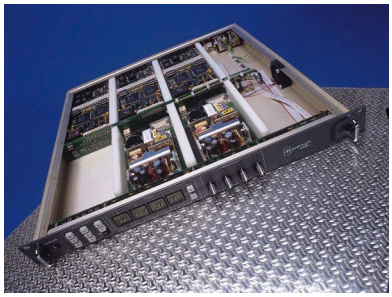

Figure 1-3 flexiBox with flexiPanel fitted

1.3.2 Control Surfaces

- A IRU control surface that fits on the Front of a 1RU Flexibox. This is called a Flexipanel (Order code FP-9). A Flexipanel can also be used in conjunction with a Minibox, in this case the extra accessory (Order code RR-9) will be required
- A desk mounting control surface (Order code FP-10). This unit is a modular unit which can be used in conjunction with the units below.

Figure 1-4 FP-10 desktop modular panel

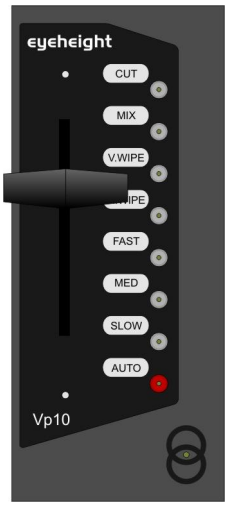

Figure 1-5 VP-10 desktop modular T-Bar

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2 Installation

2.1 Installation of the MW-3E product

If this unit is already pre-installed in a Flexibox (FB-9) with either a local or remote panel from the Factory then refer to the "Hardware Installation Guide" which will be enclosed with the system. If this unit is pre-installed in a Minibox (MB-9) also refer to the "Hardware Installation Guide" which will be enclosed with the system

If this unit has been ordered separately we assume here that you already have a Flexibox system with a Flexipanel and that the Flexibox has at least two spare slots above each other for the MW-3E card.

2.2 Installing the MW-3E into a flexiBox

To install the MW-3E into a flexiBox it is desirable (but not necessary) to power down the flexi-box. Follow these instructions.

On the rear of the flexiBox are 6 slots for Products. Remove any pair of spare blanking plates one above another. There are 2 M2.5 Screws, which require unfastening for each blanking plate.

Slide the Product PCB into the spare slots and firmly push it "home".

Use the two thumbscrews to fasten the unit in place. Take care that the ribbon cable for the upper circuit board stays attached to the lower board.

Now refer to the "GeNETics User Guide". If your system consists of a single flexiBox with a single flexiPanel then refer to the section titled "flexiPanel Auto Set-up". If your system is part of a network with more than one flexiPanel then refer to the section titled "flexiPanel Manual Set-up". This will guide you through acquiring your product as a device on the flexiPanel.

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2.3 Connecting Video to an MW-3E

A Typical Connection diagram for the MW-3E is shown below. All signals are SDI.

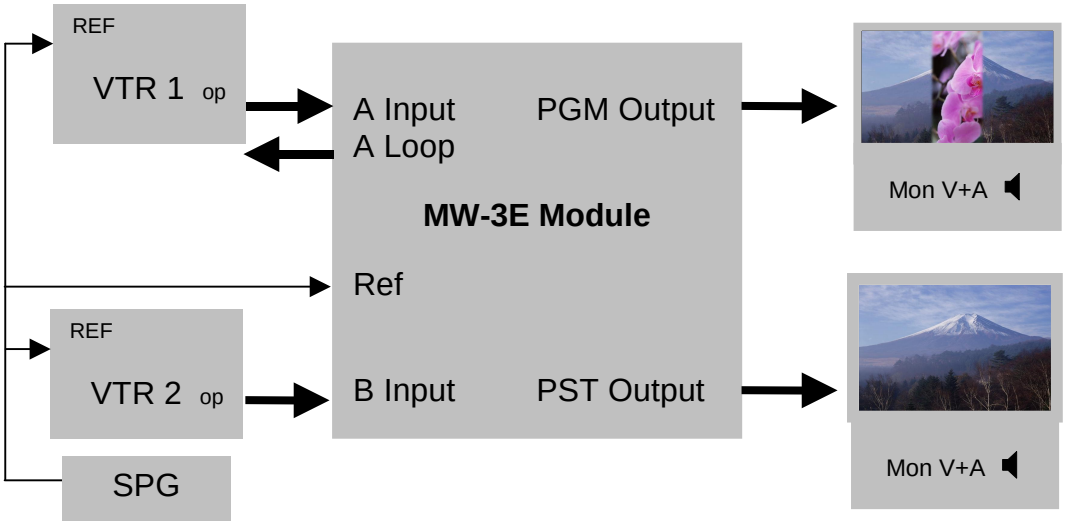

Figure 2-1 Typical connections for an MW-3E Module

In the above diagram the SPG provides a reference such that VTR1 and VTR2 give synchronous output video. The A and B input must be within +/-32uS for the MW-3E to operate correctly.

The MW-3E Module has a number of user configurable jumpers which can change the function of the 5 SDI BNC Connectors. These are shown along with their default configuration below. These jumpers are found close to the BNC Connectors.

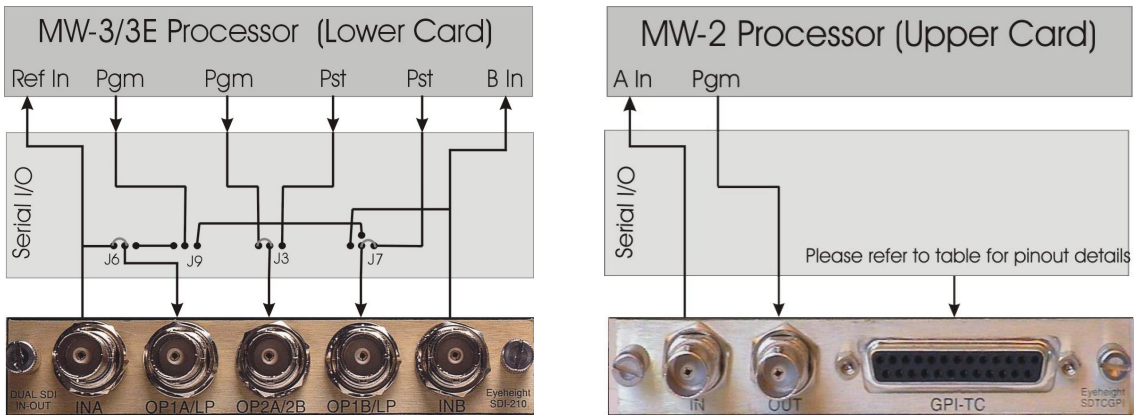

Figure 2-2 User configuration of the 7 SDI BNC Connections

2.4 Connecting Panels to the MW-3E

The MW-3E may be operated using a FP-9 Flexipanel locally mounted. For a more operational environment the MW-3E may be supplied with a desk mounting FP-10 unit and also possible a VP-10 Desk mounting Video T-Bar manual transition unit. For detailed information on connecting remote panels refer to the

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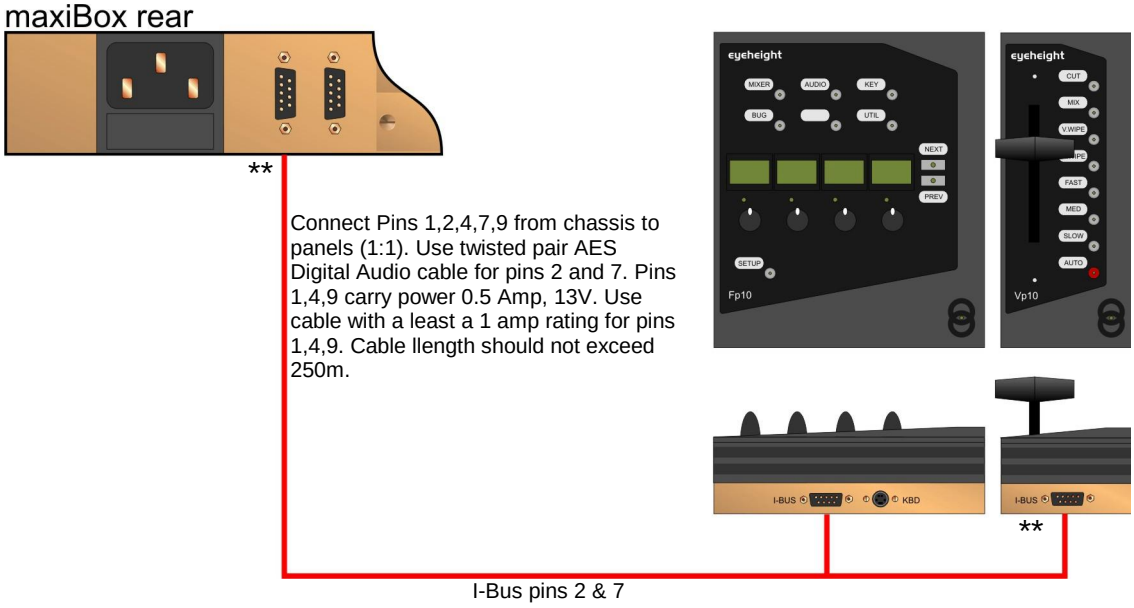
section “Connection of Remote Panels to a flexiBox” in the geNETics Hardware Installation Guide.

Below is shown a typical system consisting of an MW-3E in a flexiBox controlled by an FP-10 and a VP-10.


maxiBox rear
**
Connect Pins 1,2,4,7,9 from chassis to panels (1:1). Use twisted pair AES Digital Audio cable for pins 2 and 7. Pins 1,4,9 carry power 0.5 Amp, 13V. Use cable with a least a 1 amp rating for pins 1,4,9. Cable llength should not exceed 250m.
eyeheight
Fp10
Vp10
I-BUS
KBD
**
I-Bus pins 2 & 7

** The I-BUS Network requires terminating with 100 Ohms at each extreme end of the network. Ensure that this is done either by an external 100 ohm resistor OR ONE Panel/Product at each end has the termination set. See the "Genetics User Guide" Under the sections "Flexipanel Power/I-BUS Jumpers".For the 4RU Panels see “4RU Panel (FP-10) Jumpers for I-BUS” and “4RU Panel (VP-10, SW-10, AP-10) Jumpers for I-BUS” . Alternatively The termination can be set on a Product (ie the MW-2 module). Information about this is given in this manual.

Figure 2-3 I-Bus Connections and Termination

N.B. From 1/10/02 Eyeheight introduced a change in the Flexibox Chassis. Most versions now have two 9 way connectors on the rear labelled “I-Bus” and “D-Bus”. The “I-Bus” connector is the same as the previously labelled “Can-B” connector.

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3 Operation

3.1 Manual control of the MW-3E

Manual Control of the MW-3E is done using one or more of the following control surfaces:

- The 1RU FP-9 Flexipanel.
- The FP10 Desk mounting Panel
- The VP-10 Desk mounting Video T-BAR Manual Transition Panel.
- The TK-10 Desk mounting Manual TAKE Panel.

The FP-9 and the FP-10 have identical manual control ability. (The FP-10 is simply a desktop version of the FP-9). The VP-10 brings further functionality to the unit in the T-BAR manual transitions and the other switch functions.

The MW-3E is, as are all genetics modules, controlled using a set of MENUS. Each of these menus contains up to 3 parameters that are adjusted using the rotary digipots. The Menus define all of the adjustable operational parameters in the MW-3E. Pressing the rotary digipots brings the parameter to its default value. Device selection is done using the device select switches which, when pressed, will offer the name of the device in the LCD Window. Modules can be acquired and then de-acquired using the set-up switch. For a full description of the operation philosophy of the geNETics system refer to the “geNETics User Guide” (section “Operation of the flexiPanel”)

A full list of the Menus and their functions are given in section 3 of this chapter.

3.1.1 Naming The Sources to the MW-3E

The four named sources to the MW-3 can be renamed. The sources are normally called “Side A”, “Side B”, “Matte” and “Black”.

The procedure is as follows:

- Plug in a PS-2 Keyboard into the flexiPanel that has control of the MW-3.
- Ensure that the correct MW-3 is selected on the device buttons.
- Press F9 on the PS-2 Keyboard and the word TEXT should appear in the 4 LCD Displays.
- Type the following (Example): “1MainTX”
- Hit the RETURN key.

This will cause the “A” side of the mixer to be renamed “MainTX”. To do the “B” side of the mixer use the Prefix “2” (e.g. “2Bypass”). To do the Matte, use the “3” prefix and for black use the “4” prefix.

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3.2 Automation Control of the MW-3E

Automation of the geNETics products is achieved via an RS422 port.** This port is marked RS422 on the rear of a flexiBox. For the port to work a flexiPanel MUST be connected locally on the front of the flexiBox.

Automation control of the MW-3E can be done using two protocol methods:

- geNETics Automation Protocol.
- PresTX Automation Protocol.

Genetics protocol is described in detail in the “GeNETics User Guide” section titled “Automation Protocol on the geNETics Platform”. The menu list in section 3 of this chapter contains the data information for the protocol.

PresTX Automation Protocol is used only for the PresTX Presentation Mixer and channel branding system. In this case an AU-2 Automation card is also required. Refer to the PresTX Product manual

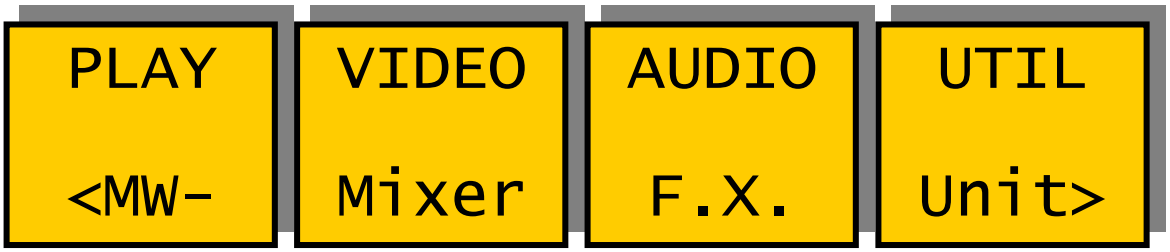
**On most Flexiboxes later than 1/10/02 the RS422 port has been replaced by a “D-Bus” Port. The D-Bus port is for High Speed data transfer and is not used for serial control.

In order to achieve serial control of any products on an I-Bus network Eyeheight Ltd have developed a RS232→I-bus converter “dongle” (DG-9). This enables greater flexibility of products on the I-Bus network whilst using the same protocols as the RS422 port.

3.3 Operational Menus for the MW-3E

menus below only apply for the MW-3E and MW-3EE units. This is indicated.

Menus 00-03 Top Level Menus



Menu Num.	Heading	Automation	Function
00	PLAY	none	Go To the main Play menus (4-7)
01	VIDEO	none	Go To the main Video menus (8-23)
02	AUDIO	none	Go To the main Audio menus (24-31)
03	UTIL	none	Go To the main Utility menus (32-63)

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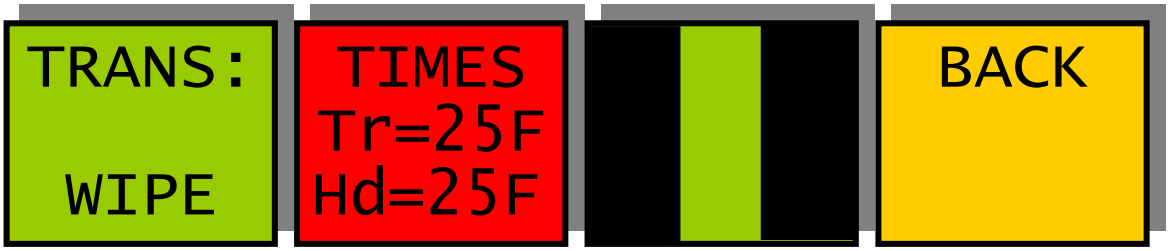
Menus 04-07 PLAY Menus

Menu Num.	Heading	Automation	Function
04	TAKE	1=take B 2=take A	This Causes the Auto Transition to occur.
05	PROGM	0=In A 1=In B 2=Matte 3=Black	This Shows the currently selected “On-air” Source. A,B matte or black (matte and black are internal sources)
06	PRSET	0=In A 1=In B 2=Matte 3=Black	This Shows the Next selected “On-air” Source. A,B matte or black (matte and black are internal sources)
07	BACK	none	Go To the Top Level Menus

Menus 08-11 VIDEO Transition Set-up Menus (NEXT for more)



Menu Num.	Heading	Automation	Function
08	TRANS	0=Mix 1=Wipe 2=Cut 3=Cut-Cut 4=Cut-Fade 5=Fade-Cut 6=Fade-Fade	This sets the transition type between Mix, Wipe and Cut and “U” and “V” fade types. “U” and “V” fades Transition to either “Black” or “Matte” and then “Hold” for a period before then transitioning to the Preset Source.
09	TIME	Menu Level “A” 1-200 Menu Level “B” 1-200	Press this button and the two digipots indicated by the lit LED’s will change the transition time (in fields - Tr) and the Hold time (in fields – Hd). The Hold time is the time that the “U” and “V” fades stay on Black (Or Matte).
10	WIPE	0=Vertical	This shows a representation of the

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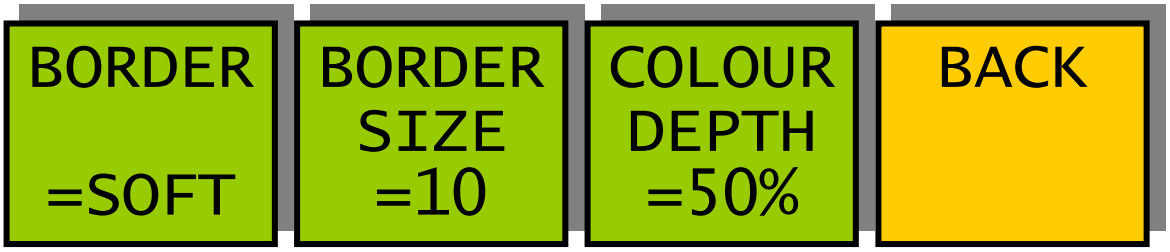
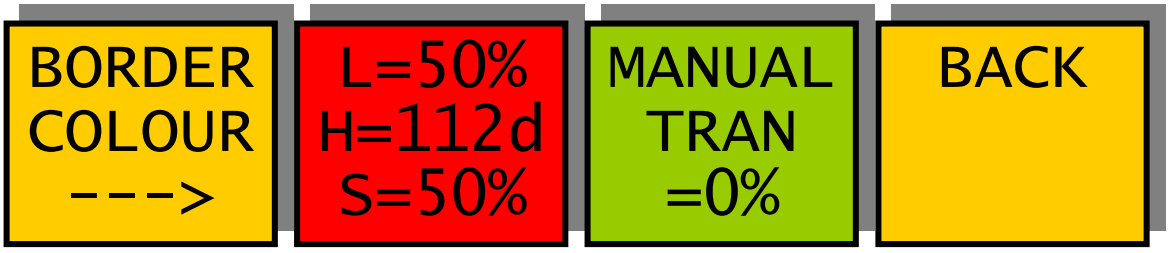
	(Pattern)	1=Horiz 2=Vert Curtain 3=Horiz Curtain 4=Diagonal 5=Diamond 6=Arrow Left 7=Arrow Up	shape of the currently selected Wipe Transition.
11	BACK	none	Go To the Top Level Menus

Menus 12-15 VIDEO Transition Set-up Menus (NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
12	BORDER	0=Off 1=Soft 2=Colour 3=Soft&Col	This selects the Type of Border on the Wipe edge between; No Border, Soft, Coloured and Soft and coloured.
13	BORDER SIZE	1-49	This sets up the Wipe Border Size between “1” (min) and “49”, (max)
14	COLOUR DEPTH	0-511	This represents the amount of colour in the border when the “Soft and coloured” border option is selected. (0-100%)
15	BACK	none	Go To the Top Level Menus

Menus 16-19 VIDEO Transition Set-up Menus (NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
16	BORDER COLOUR	NONE	Points to adjacent menu for information only.
17	L= H= S=	Menu Level “A” 0-255 (L) Menu Level “B” 0-255 (H) Menu Level “C” 0-255 (S)	Press this button and the three digipots indicated by the lit LED’s will change the Luma, Hue and Saturation of the border colour.

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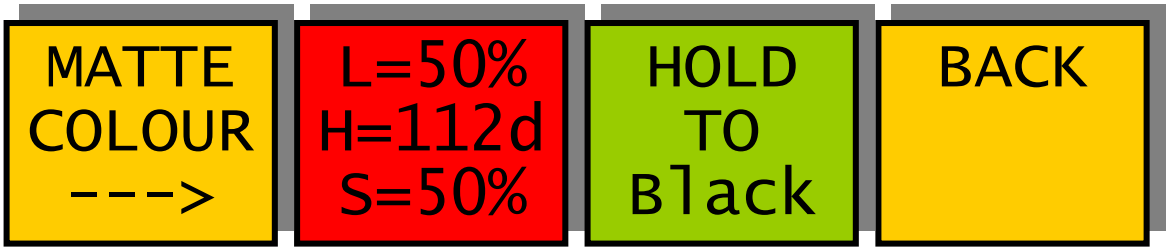
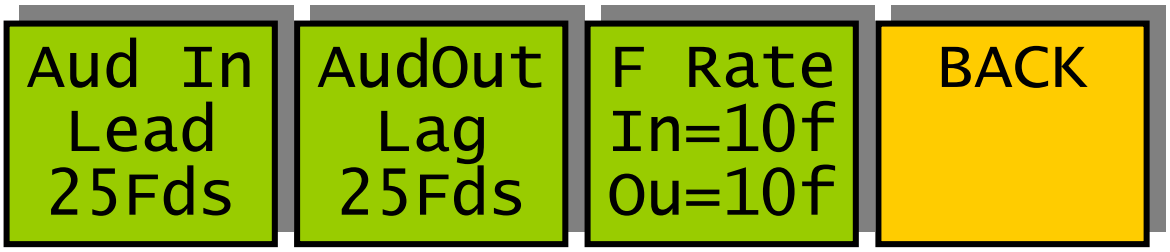
18	MANUAL TRAN	0-799	This will manually move the Transition point between PGM and PST. (0-100%)
19	BACK	none	Go To the Top Level Menus

Menus 20-23 VIDEO Transition Set-up Menus (PREV for less)



Menu Num.	Heading	Automation	Function
20	MATTE COLOUR	none	Points to adjacent menu for information only.
21	L= H= S=	Menu Level "A" 0-255 (L) Menu Level "B" 0-255 (H) Menu Level "C" 0-255 (S)	Press this button and the three digipots indicated by the lit LED's will change the Luma, Hue and Saturation of the Matte colour.
22	Hold To	0=Black 1=Matte	This is the "Intermediate" source for the "U" and "V" Fades
23	BACK	none	Go To the Top Level Menus

Menus 24-27 Audio Set-up Menus (MW-3E only) (NEXT for more)



Menu Num.	Heading	Automation	Function
24	Audio In Lead/Lag	-999→ +999 fields	Changing this value will cause the next "IN" audio to either Lead or Lag the Video Transition by the set number of fields.
25	Audio Out Lead/Lag	-999→ +999 fields	Changing this value will cause the next "OUT" audio to either Lead or Lag the Video Transition by the set number of fields.
26	Fade	0→250	Press this button and the two digipots

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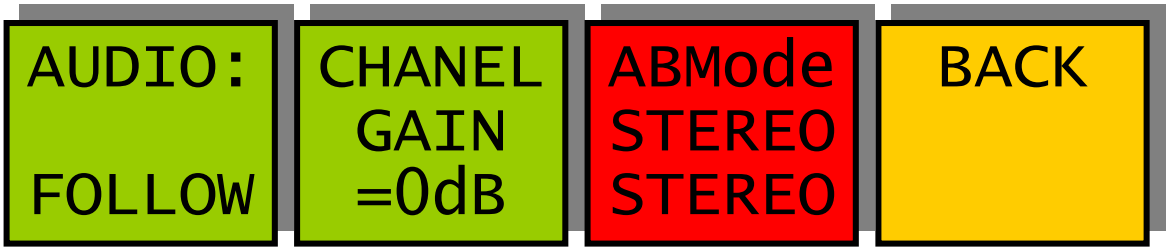
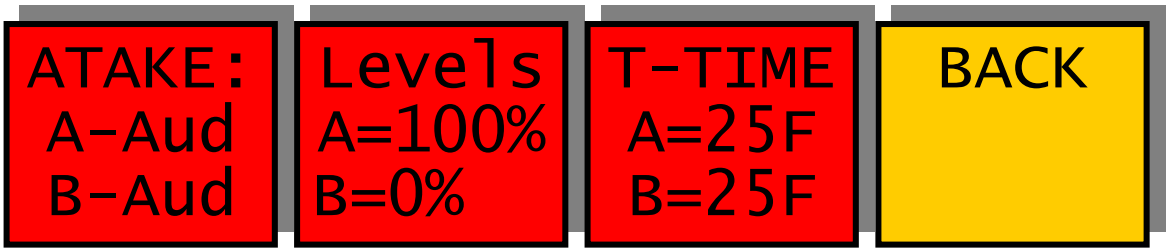
	Rate	fields	indicated by the lit LED's will change the "In" and "Out" Fade rate for the Incoming and Outgoing Audio.
27	BACK	none	Go To the Top Level Menus

Menus 28-31 AUDIO Set-up Menus (MW-3E only)(NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
28	AUDIO:	0=Follow 1=Seperate	If this is set to "Follow", the embedded audio mixing will follow the video mixing. If this is set to "Separate" the embedded audio is controlled by the transitions in next 4 menus only. Separate mode is used by Automation systems only to achieve split video/audio transitions.
29	CHANEL GAIN	0=-12dB 1=-6dB 2=0dB 3=+6dB 4=+12dB 5=+18dB	This sets the overall gain on the Embedded Audio.This applies only for the MW-3E Module, which incorporates embedded audio mixing.
30	ABmode	0=Stereo 1=L<>R 2=L→LR 3=R→LR 4=Mono	Press this button and the two digipots indicated by the respective LED's will cause modification to the A and B embedded audio as follows: Stereo (No change) Left and Right Swapped Left to both Left and Right Right to both Left and Right Mono
31	BACK	none	Go To the Top Level Menus

Menus 32-35 AUDIO Set-up Menus (MW-3E Automation only)(PREV for less)



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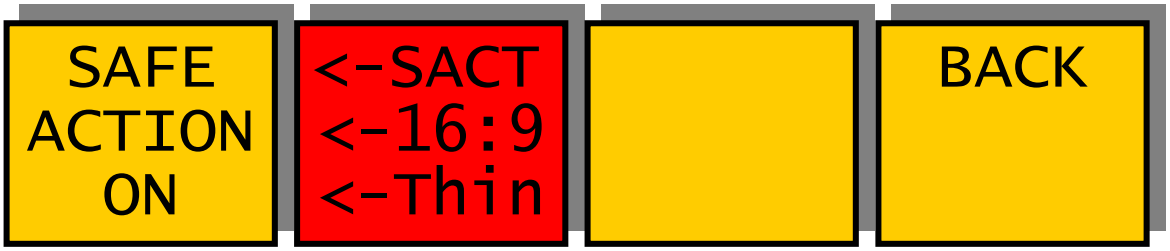
Menu Num.	Heading	Automation	Function
32	ATAKE:	Menu Level “A” 1=Take “A” Aud. Menu Level “B” 1=Take “B” Aud.	This menu is for Automation systems use only. This will start the A and B Embedded audio transition set by the next menus.
33	Levels	Menu Level “A” 0-1023 Menu Level “B” 0-1023	This sets the next audio level which will be achieved at the end of the transition started in the previous menu.
34	T-Time	Menu Level “A” 1-200 Menu Level “B” 1-200	This sets the transition time in video fields from the current audio level to the next audio level.
35	BACK	none	Go To the Top Level Menus

Menus 36-39 Utility Menus Nested Menus

Menu Num.	Heading	Automation	Function
36	Preview	none	Go To preview output menus (40-43)
37	Set-up	none	Go To system set-up menus (44-47)
38	Memories	none	Go To memory menus (48-51)
39	Back	none	Go To the main Utility menus (0-3)

Menus 40-43 Utility Menus: Safe Area Gen



Menu Num.	Heading	Automation	Function
40	SAFE ACTION	None	This Switches on and off the currently selected area. Pressing the "Red" switch next to this one and adjusting the rotary digipots with the lighted green LED's chooses the Selected

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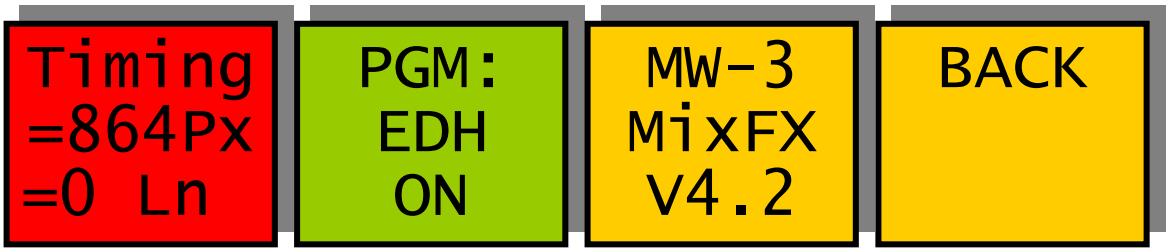
			area.
41	None	Menu Level “A” 0=S.Action 1=S.Capt. 2=DigEdge 3=An Edge Menu Level “B” 0=4:3 1=16:9 2=16p4:3 3=16p149 4=43p16:9 **Menu Level “C”** 0=Thin 1=Thick 2=Shade 3=Black	When this button is pressed to "Green". The Three-line display in the window indicates the three options, which can be changed by adjusting the three rotary digipots A, B and C. <u>Digipot A</u> Determines the basic Function Selects "Safe Action" option Selects "Safe Caption" option Selects "Digital Edge" option Selects the "An. Edge" option <u>Digipot B</u> Determines the Screen Format Standard 4:3 Screen Standard 16:9 Screen 16:9 Shoot to protect 4:3 16:9 Shoot to protect 14:9 (*) 4:3 Shoot to protect 16:9 (*) (*) -- Not available in 525 <u>Digipot C</u> Determines the Style of Indicate Thin White lines are used Thick White lines are used Shade is used for "danger area" Black is used for "danger area"
42			
43	BACK	none	Go To the Top Level Menus

Menus 44-47 Utility Menus: Timing, EDH and S/W version



Menu Num.	Heading	Automation	Function
44	Timing	Menu Level “A” 0-1439	Press this button and the two digipots indicated by the respective LED’s will cause

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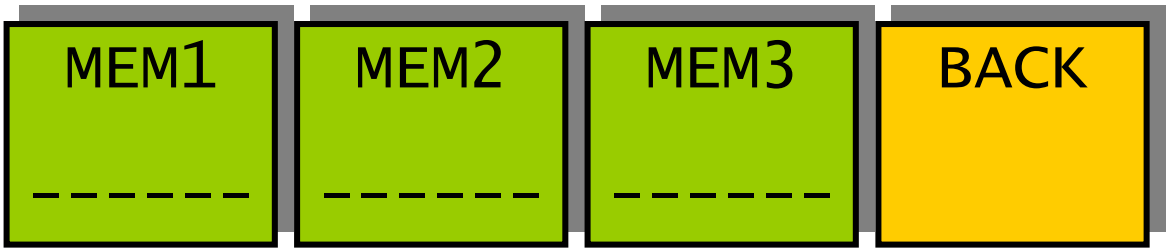
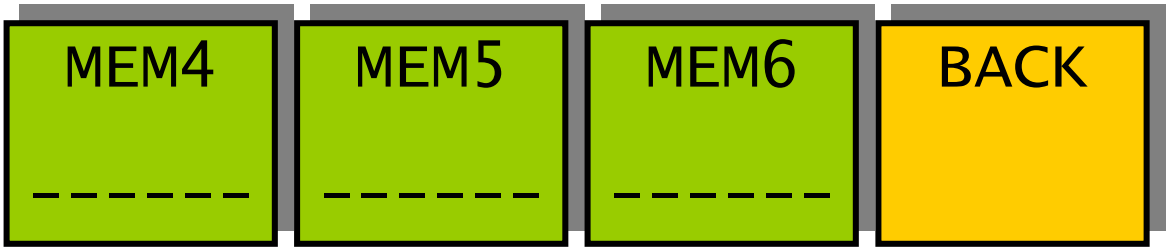
		Menu Level “B” 0-624	modification to the Pixel Timing (37nS per step) and Line Timing (64uS per step)
45	PGM:	0=EDH Off 1=EDH On	Re-insert EDH Control (Off/On)
46	Software	**none**	Shows the software version
47	BACK	none	Go To the Top Level Menus

Menus 48-51 Utility Menus: Memories (NEXT for more)



Menu Num.	Heading	Automation	Function
48	MEM1	1=Recall	Pressing this will recall Memory number 1.User Names can be programmed in to the memories using a keyboard. See “geNETics User guide”, section “Giving product Memories names”
49	MEM2	1=Recall	Pressing this will recall Memory number 2.
50	MEM3	1=Recall	Pressing this will recall Memory number 3.
51	BACK	none	Go To the Top Level Menus

Menus 52-55 Utility Menus: Memories (NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
52	MEM4	1=Recall	Pressing this will recall Memory number 4.
53	MEM5	1=Recall	Pressing this will recall Memory number 5.

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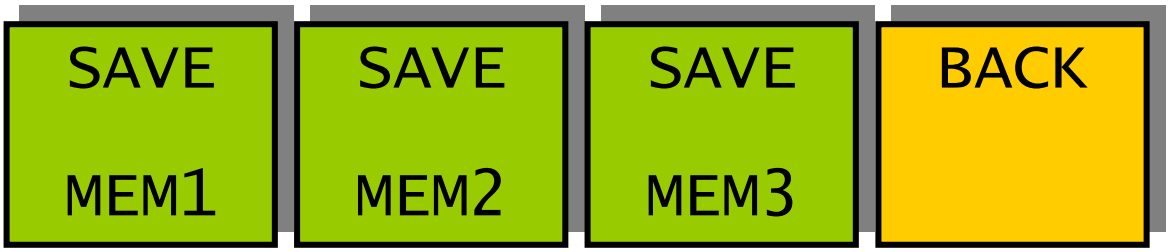
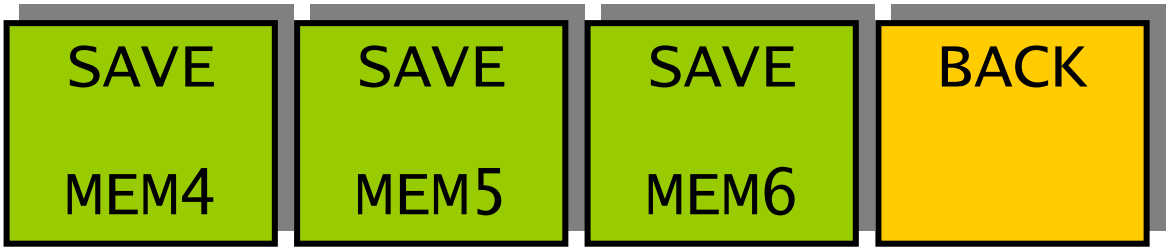
54	MEM6	1=Recall	Pressing this will recall Memory number 6.
55	BACK	none	Go To the Top Level Menus

Menus 56-59 Utility Menus: Memories (NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
56	SAVE MEM1	1=Save	Pressing this will Save Memory number 1.
57	SAVE MEM2	1= Save	Pressing this will Save Memory number 2.
58	SAVE MEM3	1= Save	Pressing this will Save Memory number 3.
59	BACK	none	Go To the Top Level Menus

Menus 60-63 Utility Menus: Memories (NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
60	SAVE MEM4	1= Save	Pressing this will Save Memory number 4.
61	SAVE MEM5	1= Save	Pressing this will Save Memory number 5.
62	SAVE MEM6	1= Save	Pressing this will Save Memory number 6.
63	BACK	none	Go To the Top Level Menus

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Menus 64-67 Utility Menus: Memories (PREV for less)

Menu Num.	Heading	Automation	Function
64	Set As Pow On Memory	1=Set	Pressing this will set the current system set-up as the Power on memory default.
65	Recall Pow On Memory	1=Recall	Pressing this will recall The Power-on memory set up in the last menu.
66	Total Reset	1=Reset	Pressing this will cause a first Birthday of the unit. All current memories and settings will be lost.
67	BACK	none	Go To the Top Level Menus

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4 Technical Appendix

4.1 Technical Specification for the MW-3E

Number of Inputs	3
Type of Inputs	270Mbit Serial Digital Video Inputs 75 Ohm
Line Length	At least 200 Meters of PSF1/3 (Typically 275 Meters)
Number of Outputs	6 Output BNC's per Card (Configurable).
Type Of Outputs	270Mbit Serial Digital Video Outputs, 75 Ohm, 800mV
Total Number Of BNC Connections	10, consisting of 3 Fixed Inputs and 6 Jumper Configurable outputs. (One BNC not used)
SDI Output Jitter	The system will add less than 0.2UI to the input Jitter. (This is only guaranteed on issue 2 or later cards)
Current Consumption	<800mA at +5V
Size	215mm by 100mm

4.2 Jumpering the I-BUS (CAN-BUS) Termination

The I-BUS Network is the "control system" under which all Products and Panels are networked together. Under certain circumstances it is necessary to terminate the network. This can be done on a Panel or a "Product". To terminate this product, locate J6 on the MW-3E Processor Card supplied which is between U1 (The large square "chip") and the Edge connector. (This is on the half of the card labelled "CHP-100 Spartan2 Processor"). Jumper this with a 2mm link.

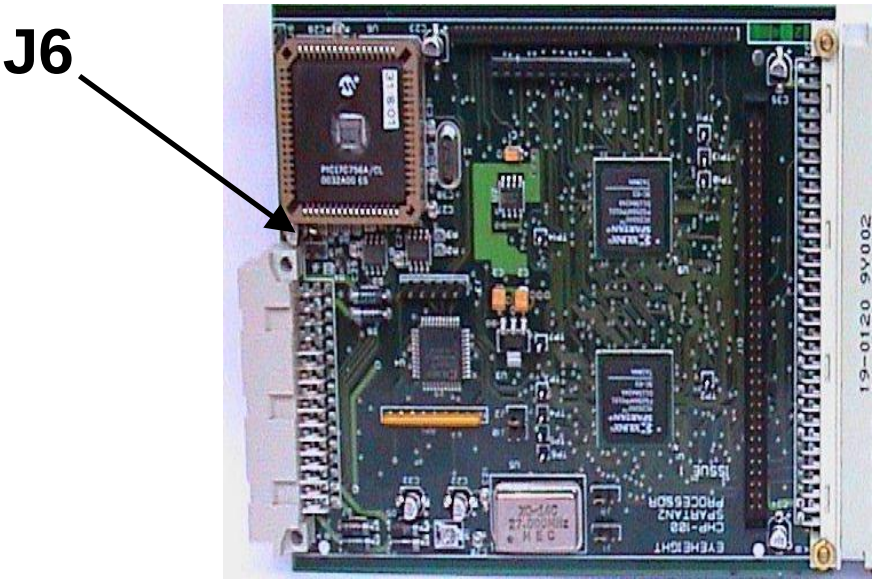

Figure 4-1 Location Of I-Bus Termination Link

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4.3 CHP-100 SDI-TC-GPI Card

4.3.1 Jumper Links on the Timecode and GPI I/O card

Jumper	Function
J2	Set to the Right, SDI Jitter Filtering selection
LK1	Set to Top, Polarity selection for GPI Relay Output#1
LK2	Set to Top, Polarity selection for GPI Relay Output#2
LK3	Set to Top, Polarity selection for GPI Relay Output#3
LK4	Set to Top, Polarity selection for GPI Relay Output#4

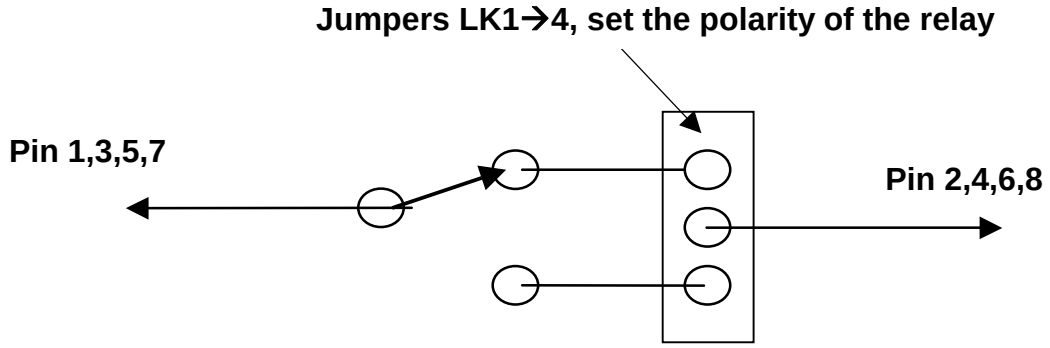

Figure 4-2 Diagram of GPI Output (GPI1-4)

4.3.2 Rear 25W D-Type Pinout

Pin#	Function
1	General Purpose Output #1a (GPO1a). Isolated Relay closure. Tally Out “A On Air”
2	General Purpose Output #1b (GPO1b). Isolated Relay closure. Tally Out “A On Air”
3	General Purpose Output #2a (GPO2a). Isolated Relay closure Tally Out “B On Air”
4	General Purpose Output #2b (GPO2b). Isolated Relay closure Tally Out “B On Air”
5	General Purpose Output #3a (GPO3a). Isolated Relay closure Tally Out “Matte On Air”
6	General Purpose Output #3b (GPO3b). Isolated Relay closure Tally Out “Matte On Air”
7	General Purpose Output #4a (GPO4a). Isolated Relay closure. Tally Out “Black On Air”
8	General Purpose Output #4b (GPO4b). Isolated Relay closure. Tally Out “Black On Air”
9	General Purpose Output #5 (GPO5). Open Collector Output (<100mA) Not Used
10	General Purpose Output #6 (GPO6). Open Collector Output (<100mA)

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	Not Used
11	General Purpose Output #7 (GPO7). Open Collector Output (<100mA) Indicates when Manual Overide of Audio Lead/Lag IN is set (Menu#80)
12	General Purpose Output #8 (GPO8). Open Collector Output (<100mA) Indicates when Manual Overide of Audio Lead/Lag OUT is set (Menu#81)
13	General Purpose Input #1 (GPI1). Pull to Ground to activate. Take To A
14	General Purpose Input #2 (GPI2). Pull to Ground to activate. Take To B
15	General Purpose Input #3 (GPI3). Pull to Ground to activate. User Programmable**
16	General Purpose Input #4 (GPI4). Pull to Ground to activate. User Programmable**
17	General Purpose Input #5 (GPI5). Pull to Ground to activate. User Programmable**
18	General Purpose Input #6 (GPI6). Pull to Ground to activate. User Programmable**
19	General Purpose Input #7 (GPI7). Pull to Ground to activate. User Programmable**. OR Audio Lead Activation GPI***
20	General Purpose Input #8 (GPI8). Pull to Ground to activate. User Programmable**. OR Audio Lag Activation GPI***
21	Time Code Input (LTC) Balanced (+). Not Used.
22	Time Code Input (LTC) Balanced (-). Not Used.
23	
24	
25	GND

** The “GPI Scripter” windows application is available from Eyeheight Ltd.

***Factory Configurable, Please Contact Eyeheight Ltd.

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